

WHAT IS CLAIMED IS:

1. A noise filter comprising:  
a transmission line which includes an insulating medium made of an insulating material, at least two signal lines provided on the insulating medium with a spacing therebetween, and a ground electrode; wherein  
one of a common-mode signal in which the directions of currents flowing in the two signal lines are the same and a normal-mode signal in which the directions of currents flowing in the two signal lines are different is eliminated; and  
an additional medium which is made of a material that is different from the insulating medium is disposed provided in the presence of only one of an electromagnetic field substantially generated by the common-mode signal and an electromagnetic field substantially generated by the normal-mode signal, thereby adjusting loss of the common-mode signal or the normal-mode signal for which the additional medium is disposed.
2. A noise filter according to claim 1, wherein the additional medium is disposed between the two signal lines.
3. A noise filter according to claim 2, wherein the insulating medium is formed of a magnetic medium made of a magnetic material, and the additional medium is formed of one of a non-magnetic medium, a space, or a low-magnetic-permeability medium having a relative magnetic permeability smaller than the magnetic medium.
4. A noise filter according to claim 1, wherein the two signal lines have a meandering zigzag configuration.
5. A noise filter according to claim 1, wherein the two signal lines have a spiral shape configuration.
6. A noise filter comprising:  
a transmission line which includes an insulating medium including a plurality of overlaid insulating layers, at least two signal lines disposed between the

corresponding insulating layers with a spacing therebetween, and two ground electrodes sandwiching the corresponding insulating layers including the at least two signal lines; wherein

one of a common-mode signal in which the directions of currents flowing in the two signal lines are the same and a normal-mode signal in which the directions of currents flowing in the two signal lines are different is eliminated; and

an additional medium which is made of a material different from the insulating medium is provided in the presence of only one of an electromagnetic field substantially generated by the common-mode signal and an electromagnetic field substantially generated by the normal-mode signal, thereby adjusting loss of the common-mode signal or the normal-mode signal for which the additional medium is disposed.

7. A noise filter according to claim 6, wherein the additional medium is disposed between the two signal lines.

8. A noise filter according to claim 7, wherein the insulating medium is formed of a magnetic medium made of a magnetic material, and the additional medium is formed of one of a non-magnetic medium, a space, or a low-magnetic-permeability medium having a relative magnetic permeability smaller than the magnetic medium.

9. A noise filter according to claim 6, wherein the two signal lines have a meandering zigzag configuration.

10. A noise filter according to claim 6, wherein the two signal lines have a spiral shape.

11. A noise filter comprising:  
a plurality of transmission lines, each of which includes an insulating medium including a plurality of overlaid insulating layers, first and second signal lines disposed between the corresponding insulating layers with a spacing therebetween, and at least two ground electrodes disposed on the uppermost surface and the lowermost surface of the transmission line by sandwiching the corresponding insulating

layers including the first and second signal lines, the first signal lines being connected in series with each other and the second signal lines being connected in series with each other between the plurality of transmission lines; wherein

one of a common-mode signal in which the directions of currents flowing in the two signal lines are the same and a normal-mode signal in which the directions of currents flowing in the two signal lines are different is eliminated; and

an additional medium which is made of a material different from the insulating medium is provided in the presence of only one of an electromagnetic field substantially generated by the common-mode signal and an electromagnetic field substantially generated by the normal-mode signal, thereby adjusting loss of the common-mode signal or the normal-mode signal for which the additional medium is disposed.

12. A noise filter according to claim 11, wherein the additional medium is disposed between the first and second signal lines.

13. A noise filter according to claim 12, wherein the insulating medium is formed of a magnetic medium made of a magnetic material, and the additional medium is formed of one of a non-magnetic medium, a space, or a low-magnetic-permeability medium having a relative magnetic permeability smaller than the magnetic medium.

14. A noise filter according to claim 11, wherein the first and second signal lines have a meandering zigzag configuration.

15. A noise filter according to claim 11, wherein the first and second signal lines have a spiral shape.

16. A noise filter comprising:  
a transmission line which includes a layered insulating medium, at least two signal lines disposed on the obverse surface of the insulating medium with a spacing therebetween, and a ground electrode disposed on the reverse surface of the insulating medium; wherein

one of a common-mode signal in which the directions of currents flowing in the two signal lines are the same and a normal-mode signal in which the directions of currents flowing in the two signal lines are different is eliminated; and

an additional medium which is made of a material different from the insulating medium is provided in the presence of only one of an electromagnetic field substantially generated by the common-mode signal and an electromagnetic field substantially generated by the normal-mode signal, thereby adjusting loss of the common-mode signal or the normal-mode signal for which the additional medium is disposed.

17. A noise filter according to claim 16, wherein the additional medium is disposed between the two signal lines.

18. A noise filter according to claim 17, wherein the insulating medium is formed of a magnetic medium made of a magnetic material, and the additional medium is formed of one of a non-magnetic medium, a space, or a low-magnetic-permeability medium having a relative magnetic permeability smaller than the magnetic medium.

19. A noise filter according to claim 16, wherein the insulating medium is formed of a dielectric medium made of a dielectric material, an incision groove is formed between the two signal lines on the obverse surface of the dielectric medium, and the additional medium is formed of a space defined in the incision groove.

20. A noise filter according to claim 16, wherein the insulating medium is formed of a magnetic medium made of a magnetic material, the additional medium is disposed between the two signal lines and is formed of one of a non-magnetic medium, a space, or a low-magnetic-permeability medium having a relative magnetic permeability smaller than the magnetic medium, and a coating film having a relative magnetic permeability higher than the additional medium covers the additional medium and the two signal lines.

21. A noise filter according to claim 16, wherein the two signal lines are arranged in a meandering zigzag configuration.

22. A noise filter according to claim 16, wherein the two signal lines are arranged in a spiral configuration.